

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1 (currently amended). A method of determining overall lightness contrast of an image comprising:

extracting pixel values of lightness from said image;

calculating an image edge contrast based on said pixel values;

calculating area contrast based on said pixel values;

calculating image range based on said pixel values;

calculating relative average lightness based on said pixel values,

and

calculating said overall lightness contrast of said image by combining said edge contrast, said image range, said area contrast and said relative average lightness.

2 (original). The method in claim 1, wherein said image edge contrast is calculated in a process comprising:

determining a local edge contrast; and

assessing a standard deviation around a mean value for said local edge contrast across an entire image to produce said image edge contrast.

3 (original). The method in claim 1, wherein said area contrast is calculated in a process comprising:

clustering lightness data into lightness areas;

counting a number of said lightness areas;

determining a mean lightness and a number of pixels in each lightness area;

computing weighting coefficients for each pair of lightness areas;

computing weighted differences in mean lightness for each pair of lightness areas; and
determining a sum of said weighted differences to produce said area contrast.

4 (original). The method in claim 1, wherein said image range is calculated in a process comprising:
choosing a maximum lightness value and a minimum lightness value;
adding said maximum lightness value and said minimum lightness value to compute a sum;
subtracting said minimum lightness value from said maximum lightness value to compute a difference; and
dividing said difference by said sum to produce said image range.

5 (currently amended). ~~The method in claim 1,~~ A method of determining overall lightness contrast of an image comprising:
extracting pixel values from said image;
calculating an image edge contrast based on said pixel values;
calculating area contrast based on said pixel values;
calculating image range based on said pixel values;
calculating relative average lightness based on said pixel values, and
calculating said overall lightness contrast of said image by combining said edge contrast, said image range, said area contrast and said relative average lightness;

wherein said calculation of said relative average lightness includes calculating a first average lightness relative to an image background and calculating a second average lightness relative to a pivot point of a tone reproduction curve in a process comprising:

computing an arithmetic mean of pixel lightness values;
computing a first absolute value of a difference between a mean lightness of said image and a lightness of said image background to produce said first average lightness; and

computing a second absolute value of a difference between said mean lightness and a lightness value of said pivot point of said tone reproduction curve to produce said second average lightness.

6 (currently amended). ~~The method in claim 1,~~ A method of determining overall lightness contrast of an image comprising:

extracting pixel values from said image;
calculating an image edge contrast based on said pixel
values;
calculating area contrast based on said pixel values;
calculating image range based on said pixel values;
calculating relative average lightness based on said pixel values, and
calculating said overall lightness contrast of said image by
combining said edge contrast, said image range, said area contrast and said relative
average lightness;

wherein said overall contrast is calculated in a linear combination of said image edge contrast, said area contrast, said image range, and said relative average lightness.

7 (currently amended). The method in ~~claim 1~~ claim 6, wherein said overall contrast is calculated in a weighted combination of said image edge contrast, said area contrast, said image range, and said relative average lightness.

8 (currently amended). A method of determining overall lightness contrast of an image comprising:

A) extracting pixel values from said image;

B) performing at least ~~two~~ one of the following processes:

~~1) extracting pixel values from said image;~~

~~2~~ 1) calculating an image edge contrast based on said pixel values;

~~3~~ 2) calculating area contrast based on said pixel values;

and

~~4~~ 3) calculating image range based on said pixel values;

and

5 C) calculating relative average lightness based on said pixel values, wherein said calculating of said relative average lightness includes calculating at least one of a first average lightness relative to an image background and a second average lightness relative to a pivot point of a tone reproduction curve; and

B D) calculating said overall lightness contrast of said image by combining said relative average lightness and at least ~~two~~ one of the following: said edge contrast, said image range, and said area contrast ~~and said relative average lightness.~~

9 (original). The method in claim 8, wherein said image edge contrast is calculated in a process comprising:

determining a local edge contrast; and

assessing a standard deviation around a mean value for said local edge contrast across an entire image to produce said image edge contrast.

10 (original). The method in claim 8, wherein said area contrast is calculated in a process comprising:

clustering lightness data into lightness areas;

counting a number of said lightness areas;

determining a mean lightness and a number of pixels in each lightness area;

computing weighting coefficients for each pair of lightness areas;

computing weighted differences in mean lightness for each pair of lightness areas; and

determining a sum of said weighted differences to produce said area contrast.

11 (original). The method in claim 8, wherein said image range is calculated in a process comprising:

choosing a maximum lightness value and a minimum lightness value;

adding said maximum lightness value and said minimum lightness value to compute a sum;

subtracting said minimum lightness value from said maximum lightness value to compute a difference; and

dividing said difference by said sum to produce said image range.

12 (currently amended). ~~The method in claim 8,~~ A method of determining overall lightness contrast of an image comprising:

A) extracting pixel values from said image;

B) performing at least one of the following processes:

1) calculating an image edge contrast based on said pixel values;

2) calculating area contrast based on said pixel values; and

3) calculating image range based on said pixel values;

C) calculating relative average lightness based on said pixel values; and

D) calculating said overall lightness contrast of said image by combining at least two of the following: said edge contrast, said image range, said area contrast and said relative average lightness;

wherein said calculating of said relative average lightness includes calculating a first average lightness relative to an image background and calculating a second average lightness relative to a pivot point of a tone reproduction curve in a process comprising:

computing an arithmetic mean of pixel lightness values;

computing an first absolute value of a difference between a mean lightness of said image and a lightness of said image background to produce said first average lightness; and

computing a second absolute value of a difference between said mean lightness and a lightness value of said pivot point of said tone reproduction curve to produce said second average lightness.

13 (original). The method in claim 8, wherein said overall contrast is calculated in a linear combination of at least two of said image edge contrast, said area contrast, said image range, and said relative average lightness.

14 (original). The method in claim 8, wherein said overall contrast is calculated in a weighted combination of at least two of said image edge contrast, said area contrast, said image range, and said relative average lightness.

15 (currently amended). A method of determining overall lightness contrast of an image comprising:

- extracting pixel values of lightness from said image;
- calculating an image edge contrast based on said pixel values;
- calculating color area contrast based on said pixel values;
- calculating image range based on said pixel values;
- calculating relative average lightness based on said pixel values;

and , ~~and~~

calculating said overall lightness contrast of said image by combining said edge contrast, said image range, said color area contrast and said relative average lightness.

16 (original). The method in claim 15, wherein said image edge contrast is calculated in a process comprising:

- determining a local edge contrast; and
- assessing a standard deviation around a mean value for said local edge contrast across an entire image to produce said image edge contrast.

17 (original). The method in claim 15, wherein said color area contrast is calculated in a process comprising:

- clustering color data into color areas;
- counting a number of said color areas;
- determining color values and a number of pixels in each color area; computing weighting coefficients for each pair of color areas;
- computing weighted differences in mean color for each pair of color areas; and
- determining a sum of said weighted differences to produce said color area contrast.

18 (original). The method in claim 15, wherein said image range is calculated in a process comprising:

- choosing a maximum lightness value and a minimum lightness value;
- adding said maximum lightness value and said minimum lightness value to compute a sum;

subtracting said minimum lightness value from said maximum lightness value to compute a difference; and
dividing said difference by said sum to produce said image range.

19 (currently amended). ~~The method in claim 15,~~ A method of determining overall lightness contrast of an image comprising:
extracting pixel values from said image;
calculating an image edge contrast based on said pixel values;
calculating color area contrast based on said pixel values; calculating image range based on said pixel values;
calculating relative average lightness based on said pixel values,
and calculating said overall lightness contrast of said image by combining said edge contrast, said image range, said color area contrast and said relative average lightness;

wherein said average lightness includes calculating a first average lightness relative to an image background and calculating a second average lightness relative to a pivot point of a tone reproduction curve in a process comprising:

computing an arithmetic mean of pixel lightness values;
computing a first absolute value of a difference between a mean lightness of said image and a lightness of said image background to produce said first average lightness; and
computing a second absolute value of a difference between said mean lightness and a lightness value of said pivot point of said tone reproduction curve to produce said second average lightness.

20 (original). The method in claim 15, wherein said overall contrast is calculated in a linear combination of said image edge contrast, said color area contrast, said image range, and said relative average lightness.

21 (currently amended). The method in ~~claim 15~~ claim 20, wherein said overall contrast is calculated in a weighted combination of said image edge contrast, said color area contrast, said image range, and said relative average lightness.

22 (currently amended). A computer program product for determining overall lightness contrast of an image, said computer program product comprising: a computer readable storage medium having a computer program stored thereon for performing a method comprising:

- extracting pixel values of lightness from said image;
- calculating an image edge contrast based on said pixel values;
- calculating area contrast based on said pixel values;
- calculating image range contrast based on said pixel values;
- calculating relative average lightness based on said pixel values,

and

- calculating said overall lightness contrast of said image by combining said edge contrast, said image range, said area contrast and said relative average lightness.

23 (original). The computer program product in claim 22, wherein said image edge contrast is calculated in a process comprising:

- determining a local edge contrast; and
- assessing a standard deviation around a mean value for said local edge contrast across an entire image to produce said image edge contrast.

24 (original). The computer program product in claim 22, wherein said area contrast is calculated in a process comprising:

- clustering lightness data into lightness areas; counting a number of said lightness areas;
- determining a mean lightness and a number of pixels in each lightness area;
- computing weighting coefficients for each pair of lightness areas;
- computing weighted differences in mean lightness for each pair of lightness areas; and
- determining a sum of said weighted differences to produce said area contrast.

25 (original). The computer program product in claim 22, wherein said image range is calculated in a process comprising:

choosing a maximum lightness value and a minimum lightness value;
adding said maximum lightness value and said minimum lightness
value to compute a sum;

subtracting said minimum lightness value from said maximum
lightness value to compute a difference; and

dividing said difference by said sum to produce said image range.

26 (currently amended). ~~The computer program product in claim~~
22, A computer program product for determining overall lightness contrast of an
image, said computer program product comprising: a computer readable storage
medium having a computer program stored thereon for performing a method
comprising:

extracting pixel values from said image;

calculating an image edge contrast based on said pixel
values;

calculating area contrast based on said pixel values;

calculating image range based on said pixel values;

calculating relative average lightness based on said pixel values, and

calculating said overall lightness contrast of said image by combining
said edge contrast, said image range, said area contrast and said relative average
lightness;

wherein said calculation of said relative average lightness includes
calculating a first average lightness relative to an image background and
calculating a second average lightness relative to a pivot point of a tone
reproduction curve in a process comprising:

computing an arithmetic mean of pixel lightness values;

computing a first absolute value of a difference between a
mean lightness of said image and a lightness of said image background to
produce said first average lightness; and

computing a second absolute value of a difference between
said mean lightness and a lightness value of said pivot point of said tone
reproduction curve to produce said second average lightness.

27 (original). The computer program product in claim 22, wherein said overall contrast is calculated in a linear combination of said image edge contrast, said area contrast, said image range, and said relative average lightness.

28 (currently amended). The computer program product in ~~claim 22~~ claim 27, wherein said overall contrast is calculated in a weighted combination of said image edge contrast, said area contrast, said image range, and said relative average lightness.

29 (new). A method of determining overall lightness contrast of an image comprising:

- extracting pixel values of lightness from said image;
- calculating an image edge contrast based on said pixel values;
- calculating area contrast based on said pixel values;
- calculating image range based on said pixel values;
- calculating relative average lightness based on said pixel values,

and

calculating said overall lightness contrast of said image by combining said edge contrast, said image range, said area contrast, and said relative average lightness;

wherein said image edge contrast is calculated in a process comprising:

- detecting edges in said image based on said pixel values;
- determining local edge contrast at said edges; and
- assessing a standard deviation around a mean value for said local edge contrast of said edges to produce said image edge contrast.

30 (new). A method of determining overall lightness contrast of an image having a plurality of pixels, said method comprising:

- calculating an image edge contrast based on values of said pixels;

calculating area contrast of said image based on values of said pixels;
calculating image range contrast based on values of said pixels;
calculating relative average lightness of said image based on values of said pixels, and
calculating said overall lightness contrast of said image, said overall lightness contrast being a linear combination of said edge contrast, said area contrast, said image range contrast, and said relative average lightness.

31 (new). The method of claim 30, wherein said image edge contrast is calculated in a process comprising:

detecting edges in said image based on said pixel values;
determining local edge contrast at said edges; and
assessing a standard deviation around a mean value for said local edge contrast of said edges to produce said image edge contrast.

32 (new). The method of Claim 32 wherein said calculating said area contrast further comprises determining a mean lightness.

33 (new). The method of claim 30, wherein said calculating of said image range contrast includes determining a maximum lightness value and a minimum lightness value.

34 (new). The method of Claim 30 wherein said calculating of said relative average lightness includes calculating at least one of a first average lightness relative to an image background and a second average lightness relative to a pivot point of a tone reproduction curve.

35 (new). A method of determining overall lightness contrast of an image, said method comprising:

calculating edge contrast of said image;
calculating area contrast of said image;
calculating image range contrast of said image;

calculating relative average lightness of said image, and
calculating said overall lightness contrast of said image, said
overall lightness contrast being a linear combination of said edge contrast, said
area contrast, said image range contrast, and said relative average lightness.